KUL'SKIY, L.A., KOGANOVSKIY, A.M., STEMPKOVSKAYA, L.A.

Qualitative automatic control of the ferric-chloride coagulant based on the oxido-reduction potential. Ukr.khim.zhur. 20 no.6: 693-700 '54. (MLRA 8:3)

1. Institut obshchey i neorganicheskoy khimii Akademii nauk USSR.
(Water--Purification)(Ferric chloride)(Automatic control)

KOGANOVSKIY, A.M.

AID P - 2626

Subject : USSR/Medicine

Card 1/1 Pub. 37 - 3/22

Authors : Kul'skiy, L. A., Koganovskiy, A. M., Rovinskaya, T. M.

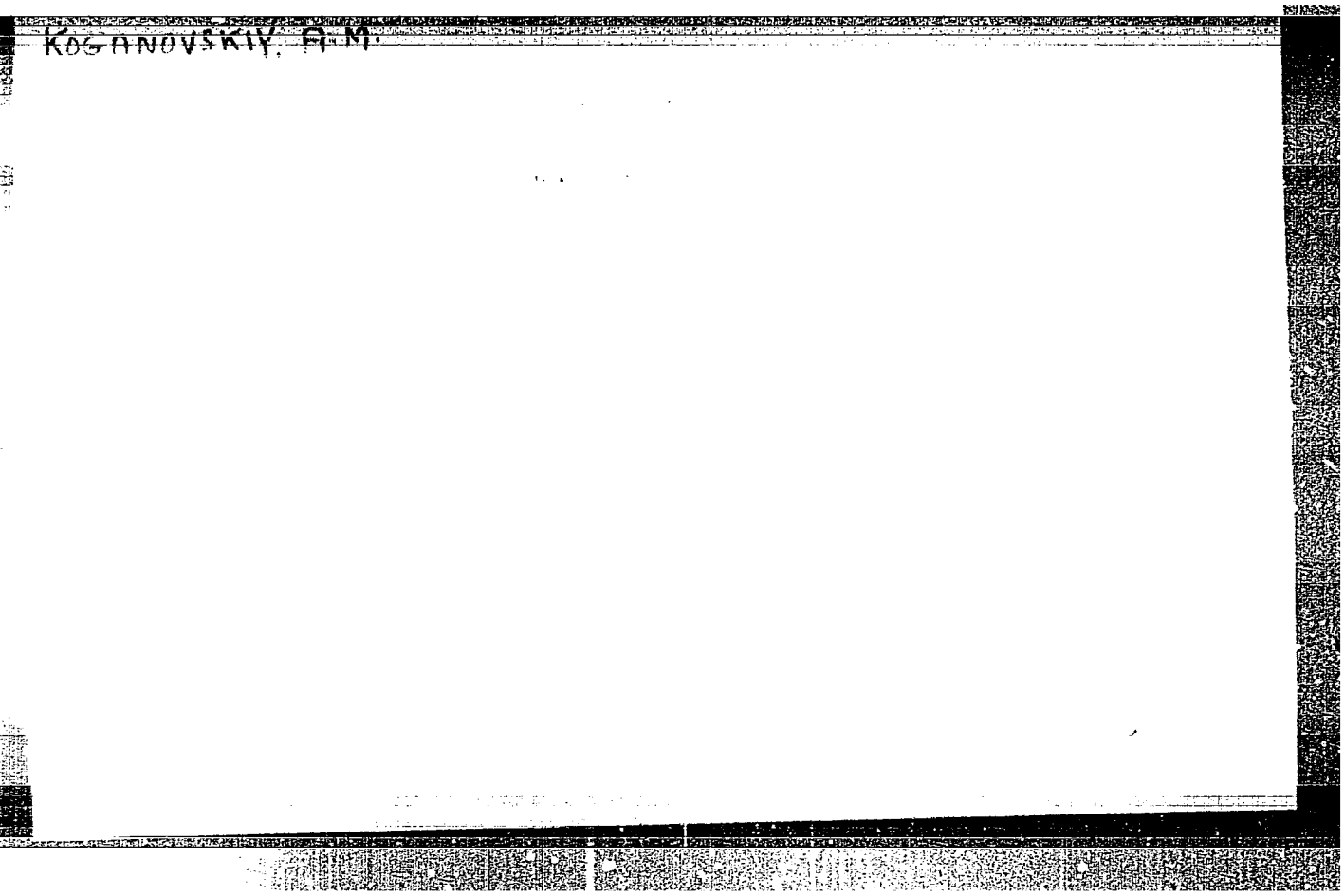
Title : Effect of sodium silicate on the purification of water by coagulation

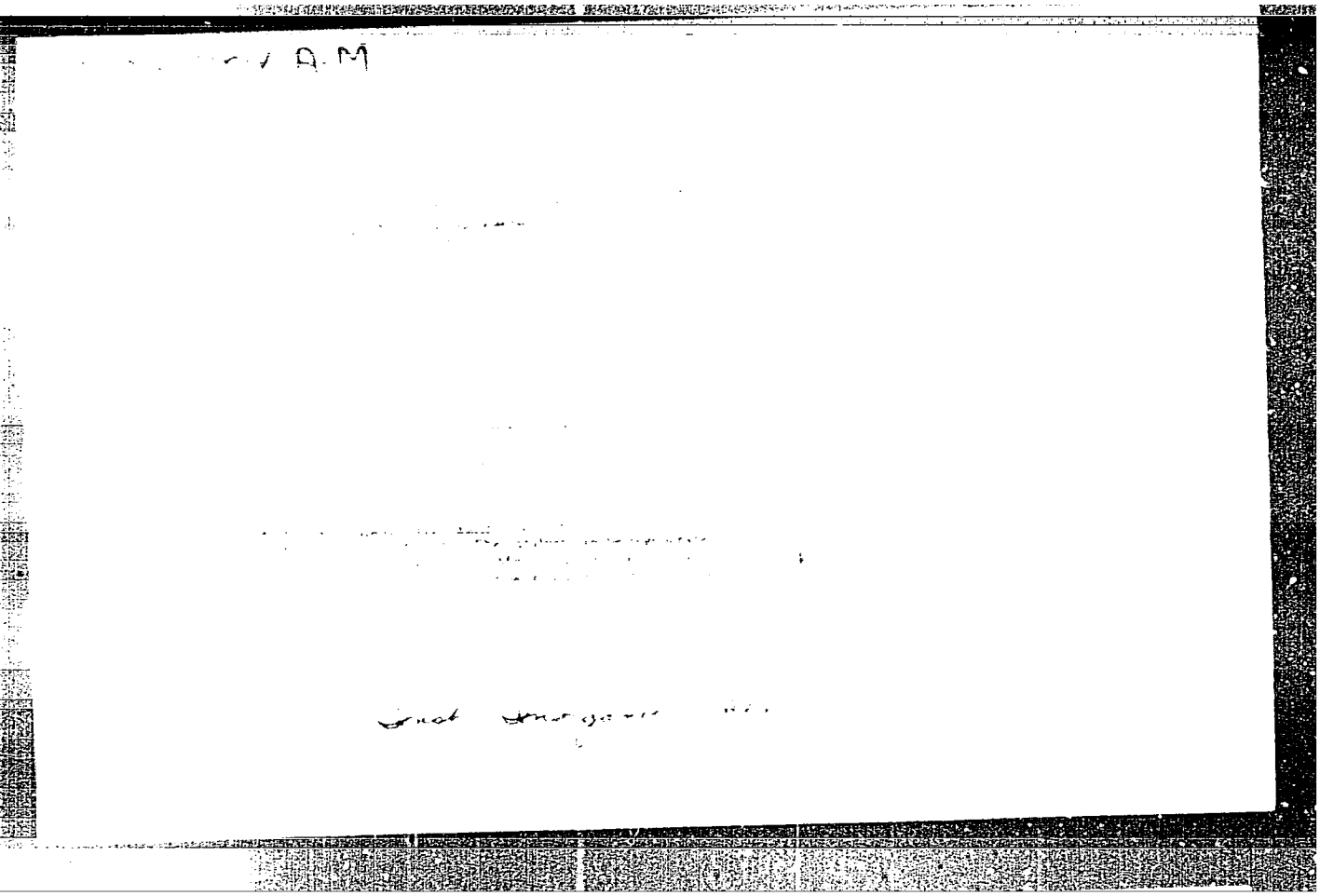
Periodical : Gig. i san., 8, 12-15, Ag 1955

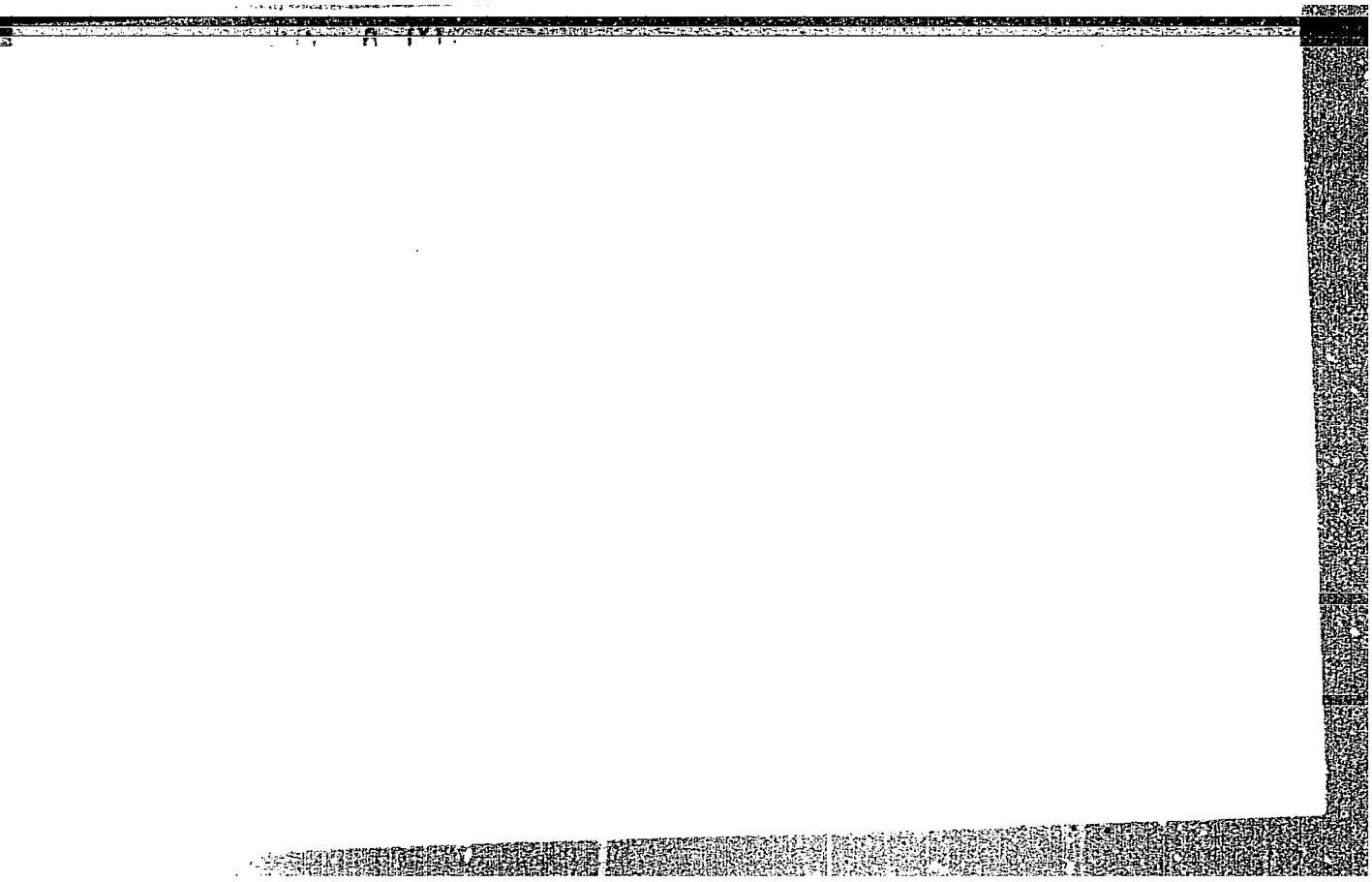
Abstract : Various tests for purifying and decolorizing the water by different chemicals are described. It is demonstrated that ferric chloride is a better decolorizing agent and a better activator of flocculation than sodium silicate. The addition of the latter to water is therefore not recommended. Tables. 4 refs., 1937 - 1953.

Institution : Institute of General and Inorganic Chemistry, Acad. of Sci., Ukr. SSR

Submitted : Jl 18, 1954







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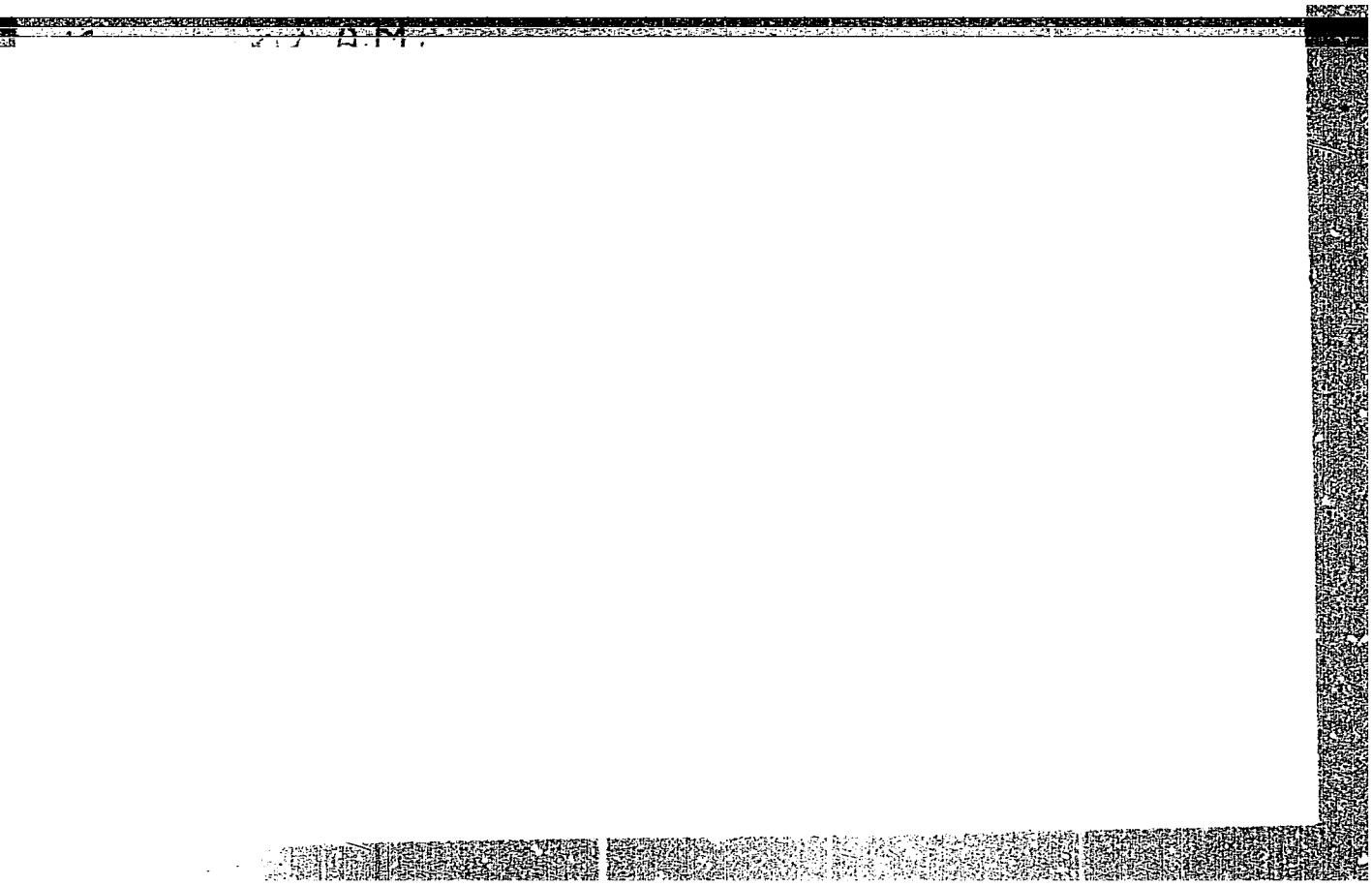


KOGANOVSKIY, A.M.

73-1-22/26

AUTHOR: Kul'skiy, L. A., Koganovskiy, A. M., Makhorin, K. Ye., Kaliniychuk, Ye. M., Chertov, V. M. and Dikolenko, Ye. I.

TITLE: Production of Active Anthracite Suitable for the Purification of Waste Waters of the Aniline-Dye Industry. (Polucheniye Aktivirovannogo Antratsita, Prigodnogo Dlya Ochistki Stochnykh Vod Anilinokrasochnoi Promyshlennosti.)

PERIODICAL: Ukrainskiy Khimicheskiy Zhurnal, 1957, Vol. 23, No.1, pp. 117 - 121 (USSR).

ABSTRACT: Laboratory and pilot plant investigations on the activation of anthracite by water vapour and a mixture of combustion products of carburetted benzene with water vapours at 800 - 950° C are described. It was found that the quality of obtained adsorbents depended on the treatment of the anthracite. The activated anthracite contained 150 - 200 mg/g phenol and up to 300 mg/g methylene. The activation of anthracite gives an absorbent with a phenol content of 125 - 165 mg/g and a methylene content of 120-130 mg/g. Activated coal KAD is produced. The usefulness of the activated anthracite for sorption purification of waste waters of the aniline-dye industry is evaluated. The kiln for the activation of anthracite is illustrated and described. The properties of activated anthracite

Card 1/2

KOGANOVSKIY, A.M.

73-2-19/22

AUTHORS: Koganovskiy A.M., Rovinskaya T.M. and Taran, P.N.

TITLE: Oxidation of thiosulfate and sulphide in aqueous solutions on aeration in the presence of pyrolusite. (Okisleniye tiosul'fata i sul'fida v vodnykh rastvorakh pri aeratsii v prisutstvii pirolyuzita).

PERIODICAL: "Ukrainskiy Khimicheskiy Zhurnal" (Ukrainian Journal of Chemistry), Vol.23, No.2, March-April, 1957, pp.256-265 (USSR).

ABSTRACT: Thiosulphate is one of the strongest oxidation inhibitors for sulphate solutions. It oxidises on pyrolusite simultaneously with the sulphite; in the absence of pyrolusite no oxidation of the thiosulphate by air-oxygen occurs. The catalytic oxidation of dilute solutions of sulphite, thiosulphate and sulphide and their mixtures with the aid of air-oxygen is of paramount importance for the aniline-dye and oil industries (waste waters). A detailed investigation of the kinetics of the reaction showed that in the presence of pyrolusite and 30-35 minute-aeration quantitative oxidation of thiosulphate solutions is achieved (at concentrations not exceeding 50 mg-equ./l). Oxidation proceeds at a greater rate in an acid medium and at a slower rate in alkaline media

Card 1/3

Oxidation of thiosulfate and sulphide in aqueous solutions on aeration in the presence of pyrolusite. (Cont.)

(pH 11 - 12), (Diagrams 1-3). In both media the reaction is of the first order. Only 30% of sulphur passes into the sulphate, the remainder being found in the form of polythionates. The quantity of thiosulphate oxidising up to the poisoning of the pyrolusite is independent of the initial concentration of the solution is constant/unit weight for the same catalyst. Faster oxidation of sulphides by aeration in the presence of pyrolusite occurs. The main produce is thiosulphate, sulphate and a small quantity of polythionates. The oxidation of a mixture of sulphate, thiosulphate and sulphide is more intensive than the oxidation of the separate components because of the interaction of these substances amongst themselves and with the reaction products. The aeration of the solutions on pyrolusite can be utilised for the purification of sulphur-contaminated effluents of chemical plants producing organic chemicals. Experiments were carried out in a 30 mm diameter glass column filled with pyrolusite granules (480 g) previously activated with 5% H_2SO_4. Onto this 200 ml thiosulphate solution was poured and air was

Oxidation of thiosulfate and sulphide in aqueous solutions on aeration in the presence of pyrolusite. (Cont.)

bubbled through at a velocity of 127 l/hour. HCl or alkali was added to achieve changes in pH. The relation of time of practically complete breakdown of thiosulphate during the aeration of the solutions is tabulated. (Table 1). Table 2 gives the dependence of the composition of the oxidation products of thiosulphate on the pH of the solution. The effect of poisoning of the pyrolusite on the composition of the oxidation products is shown in Table 4.

There are 3 diagrams, 9 tables and 15 references, 4 of which are Slavic.

ASSOCIATION: Institute of General and Inorganic Chemistry, Academy of Sciences, Ukraine. (Institut Obshchey i Neorganncheskoy Khimii AN USSR).

SUBMITTED: June 19, 1956.

AVAILABLE: Library of Congress

Card 3/3

KOGANOVSKIY, O.M.

KUL'SKIY, L.A. [Kul's'kyi, L.A.], doktor tekhn.nauk, otv.red.; KALYUZHNYY, D.M. [Kaliuzhnyi, D.M.], doktor med.nauk, red.; KVITNITSKAYA, N.M. [Kvitnyts'ka, N.M.], kand.med.nauk, red.; KOGANOVSKIY, O.M. [Kohanovs'kyi, O.M.], kand.khim.nauk, red.; SOTNIKOVA, O.V. [Sotnykova, O.V.], kand.med.nauk, red.; SHKURKO, V.L., red.; YURCHISHIN, V.I. [IUrchyshin, V.I.] tekhn.red.

[Sanitary protection of water supplies and industrial sewage purification] Sanitarna okhorona vodoimyshch i ochystka promyslovykh stichnykh vod. Kyiv, Vyd-vo Akad.nauk URSR, 1959. 162 p. (MIRA 12:7)

1. Akademiya nauk USSR, Kiyev. Rada po vyvchennyu produktyvnukh syl URSR.
(Sewage--Purification) (Water supply--Hygienic aspects)

14(0)

AUTHORS: Kul'skiy, L. A., Koganovskiy, A. M., Rybchinskiy, M. A. SOV/64-58-8-13/19

TITLE: A Countercurrent Adsorber With a Two-Stage Suspended Layer (Protivotochnyy adsorber s dvukh"yarusnym vzveshennym sloyem)

PERIODICAL: Khimicheskaya promyshlennost', 1958, Nr 8, pp 498 - 499 (USSR)

ABSTRACT: The use of suspended adsorbents in the purification of industrial waste waters has a number of advantages, but also one drawback in comparison to fixed adsorption layers: the adsorption volume actually used is much smaller (Ref 1). As a result of previous investigations (Ref 2) an adsorber was designed (Fig), in which the suspended adsorbent is contained in two vessels separated from one another. The water which is to be purified through them in succession while the adsorbent automatically flows (counter to the water) from one vessel into the other. The two vessels constitute an organic glass column of 2.2m height. The top vessel is larger than the bottom one. Water containing about 100 mg/l phenol was

Card 1/2

conducted through the apparatus at a rate of 240 l/h, i.e. a linear speed of 6.6 mm per second. A table with comparative data proves that the use of a two-stage column results in a lower adsorbent (active coal) consumption than would be the case with a simple column. There are 1 figure, 1 table and 2 Soviet references.

ASSOCIATION: Institut obshchey i neorganicheskoy khimii AN USSR (Institute of General and Inorganic Chemistry AS UkrSSR)

5(1) SOV/64-59-4-12/27

AUTHORS: Kul'skiy, L. A., Koganovskiy, A. M., Kaliniychuk, Ye. M., Nikolenko, Ye. I.

TITLE: Regeneration of Activated Coal After Adsorption Purification of Waste Waters in the Aniline Dyestuff Industry (Regeneratsiya aktivirovannogo uglya posle adsorbtsionnoy ochistki stokov anilinokrasochnoy promyshlennosti)

PERIODICAL: Khimicheskaya promyshlennost', 1959, Nr 4, pp 46-49 (USSR)

ABSTRACT: The regeneration of activated coal (AC) which may be used for purifying waste waters in aniline dyestuff factories is most suitably carried out by thermal-destructive regeneration. The first experiments of a simple annealing of the (AC) of the type KAD at 600-850°, without or with limited air admission have shown (Tables 1, 2) that already after having repeated the treatment for 3 - 4 times nearly complete deactivation of the (AC) occurs. Further investigations were carried out in superheated steam current with KAD and a relatively inert anthrazite (AN) which was produced according to the method IONKh AN UkrSSR (Ref 9). Regeneration was carried out in the laboratory in a retorte (previously heated up to 750°) in steam current at

Card 1/2

750° for 20 minutes. The different substances corresponding to the above mentioned waste waters were adsorbed in (AC) and (AN) in different test series, and (AC) and (AN) were then regenerated. Experiments (Table 3) have shown that on heating the KAD in steam current at 700-750° for 20-40 minutes ((AN) for 60 minutes) a complete regeneration without a decrease in the adsorption properties may be obtained. The steam consumption is 0.9 - 1 g/g for KAD and 1 - 2 g/g for (AN) at a mean carbon consumption of 5-6%. For the purpose of obtaining high quality of regenerated coal with small carbon consumption, the temperature must rise slowly in the beginning of the regeneration process. The different composition of waste waters of aniline factories hardly influences the quality of the regenerated coal. For the purpose of checking laboratory experiments, two semi-industrial experiments were made in cooperation with K. Ye. Makhorin and V. M. Chertov. For these experiments a mixture of steam and carburetor gas - combustion products was used. The results obtained are given (Table 4). There are 2 figures, 4 tables, and 9 references, 8 of which are Soviet.

CHERTOV, V.M.; MAKHORIN, K. Ye.; KOGANOVSKIY, A.M.

Combining processes for the production and regeneragtion of activated anthracite. Khim.prom. no.7:635-637 O-N '59. (MIRA 13:5)

(Carbon, Activated) (Anthracite)

KUL'SKIY, L.A.; KOGANOVSKIY, A.M.; GORONOVSKIY, I.T.; SHEVCHENKO, M.A.; DUMANSKIY, A.V., prof., otv.red.; MUSNIK, N.I., tekhred.

[Physicochemical foundations of water purification through coagulation] Fiziko-khimicheskie osnovy ochistki vody koaguliatsiei. Kiev, Izd-vo Akad.nauk USSR, 1960. 107 p. (MIRA 13:7)

1. Deystvitel'nyy chlen Akademii nauk Ukrainskoy SSR (for Dumanskiy).

(Water--Purification)

KOGANOVSKIY, A.M.; STEMPKOVSKAYA, L.A.

Adsorption of dissolved substances by the fluidized bed of activated carbon, and the bed saturation gradient. Zhur. prikl. khim. 33 no.9:2042-2049 S '60. (MIRA 13:10)
(Carbon, Activated) (Adsorption) (Fluidization)

KOGANOVSKIY, A.M.; ROVINSKAYA, T.M.

Effect of strong electrolytes on the activated carbon adsorption of benzene derivatives from aqueous solutions. Koll.zhur. 23 no.6: 712-717 N-D '61. (MIRA 14:12)

1. Institut obshchey i neorganicheskoy khimii AN USSR, Kiyev.
(Benzene) (Adsorption) (Electrolytes)

ROVINSKAYA, T.M.; KOGANOVSKIY, A.M.

Relationship between adsorption from aqueous solutions and the structure of dissolved substances. Part 1: Dependence of the adsorption of benzene derivatives on the dissociation of functional groups. Koll.zhur. 23 no.6:739-748 N-D '61. (MIRA 14:12)

1. Institut obshchey i neorganicheskoy khimii AN SSSR, Kiyev.
(Benzene) (Adsorption) (Dissociation)

BEKHER, P.M.; KOGANOVSKIY, A.M.; KRAYUKHINA, N.N.; MYSHKINA, N.P.; TARAN, P.M.; TROYANOV, I.A.; SHEYN, S.M.

Adsorption removal of aromatic compounds from the waste waters of aniline dye production. Ukr. khim. zhur. 27 no.2:268-273 '61. (MIRA 14:3)

1. Institut obshchey i neorganicheskoy khimii AN USSR i Rubezhanskiy filial Nauchno-issledovatel'skogo instituta organicheskikh poluproduktov i krasiteley.

(Salvage(Waste, etc.))
(Aromatic compounds)

KOGANOVSKIY, A.M.

Adsorption of a mixture of organic substances from a solution by a suspended bed of activated carbon. Ukr.khim.zhur. 27 no.3:408-413 '61. (MIRA 14:11)

1. Institut obshchey i neorganicheskoy khimii AN USSR.
(Adsorption)
(Carbon, Activated)

KUL'SKIY, Leonid Adol'fovich[Kul's'kyi, L.A.]; KOGANOVSKIY, Aleksandr Markovich [Kohanovs'kyi, O.M.]; BURKSER, Ye.S.[Burkser, IE.S.], otv. red.; MUSNIK, M.Y.[Musnik, M.I.], red.; MATVIICHUK, O.A., tekhn. red.

[New methods for the purification of waste waters from chemical plants] Metody ochyshchennia stichnykh vod khimichnoi promyslovosti. Kyiv, 1961. 44 p. (Tovarystvo dlia poshyrennia politychnykh i naukovykh znan' Ukrains'koi RSR. Ser.6, no.19) (MIRA 15:2)

1. Chlen-korrespondent Akademii nauk USSR (for Burkser).
(Sewage--Purification)

KUZYAKIN, Ye.B.; KOGANOVSKIY, A.M.

Dependence of the speed of deposit precipitation on the ionic content of waste waters during their defluoridation by lime, aluminum sulfate, and polyacrylamide. TSvet.met. 35 no.12:40-42 D '62. (MIRA 16:2)

(Water--Purification) (Ion exchange)

ZAGRAY, Ya.M.; KUL'SKIY, L.A.; KOGANOVSKIY, A.M.

Use of a fluidized bed of cation exchangers for the removal of zinc from sewage waters. Khim.volok. no.2:58-61 '63. (MIRA 16:5)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR.
(Ion exchange) (Sewage--Purification) (Zinc)

KUL'SKIY, L.A.; ZAGRAY, Ya.M.; KOGANOVSKIY, A.M.

Use of a fluidized bed of cation exchangers for the removal of nonferrous and heavy metals from waste waters. Ukr. khim. zhur. 29 no.11:1228-1232 '63. (MIRA 16:12)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR.

ZAGRAY, Ya.M.; KOGANOVSKIY, A.M.; KUL'SKIY, L.A.

Study of the conditions of ion exchange in a fluidized bed of cation exchangers. Ukr.khim. zhur. 29 no.12:1326-1332 '63. (MIRA 17:2)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR.

KUL'SKIY, L.A.; KOGANOVSKIY, A.M.; SHEVCHENKO, M.A.

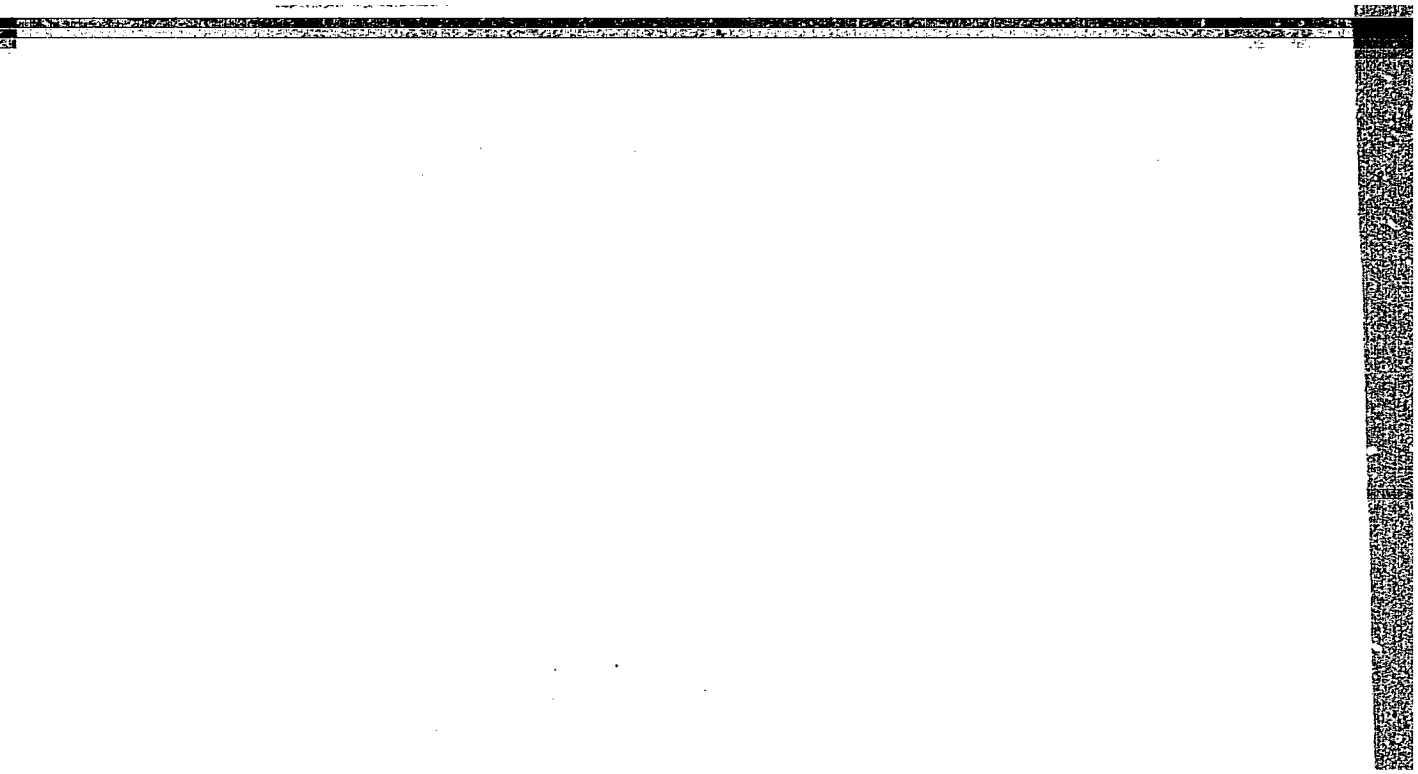
Chemical problems involved in the protection of bodies of water and improvement of the quality of water. Ukr. khim. zhur. 30 no.12:1241-1246 '64 (MIRA 18:2)

KOGANOVSKIY, A. V.

Adsorption of sulfonated aliphatic alcohols from aqueous salt solutions by channel black and graphite. Koll. zhur. 24 no.6: 702-708 N-D '62. (MIRA 16:1)

1. Institut obshchey i neorganicheskoy khimii AN UkrSSR, Kiyev.

(Alcohols) (Adsorption) (Micelles)



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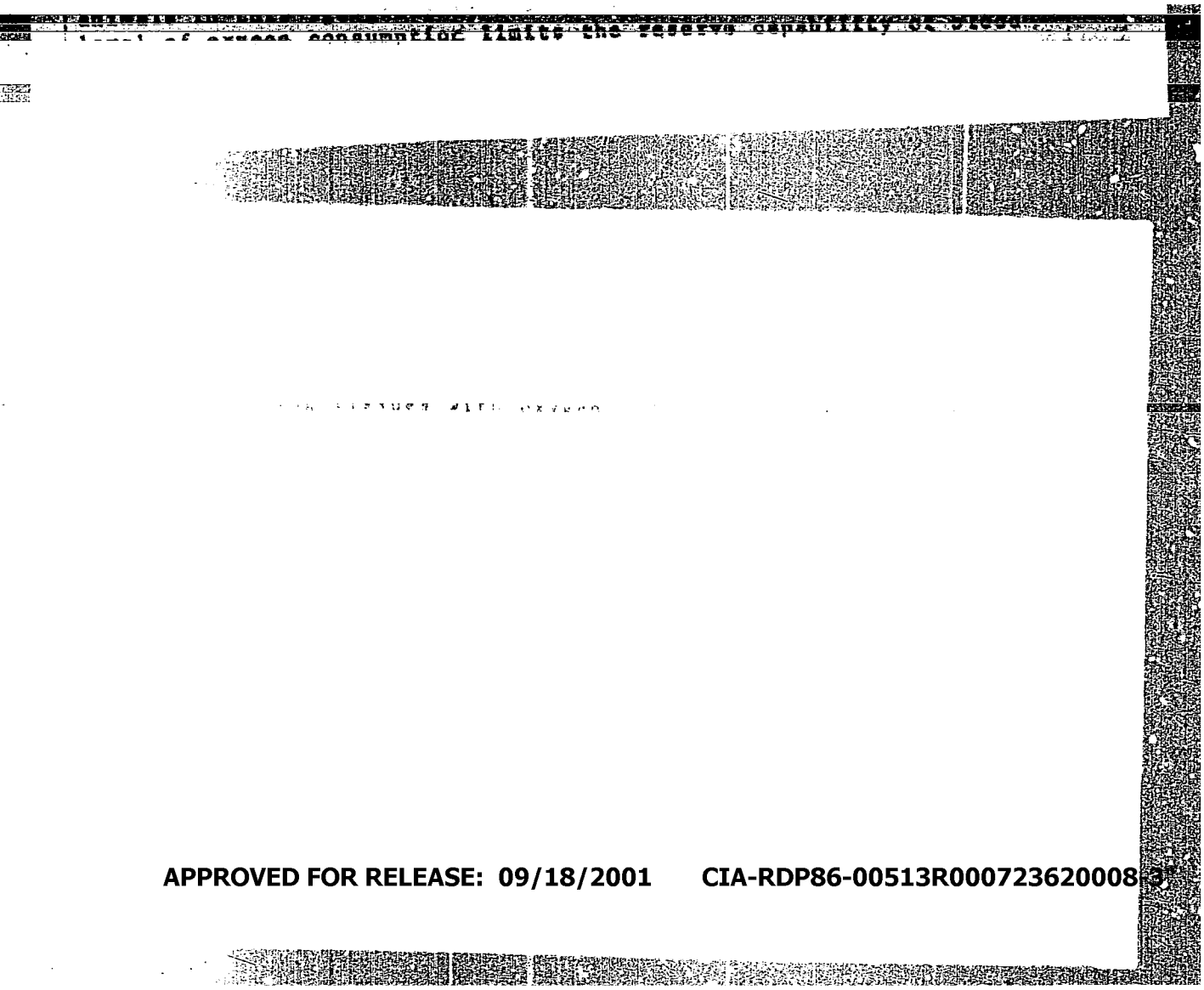

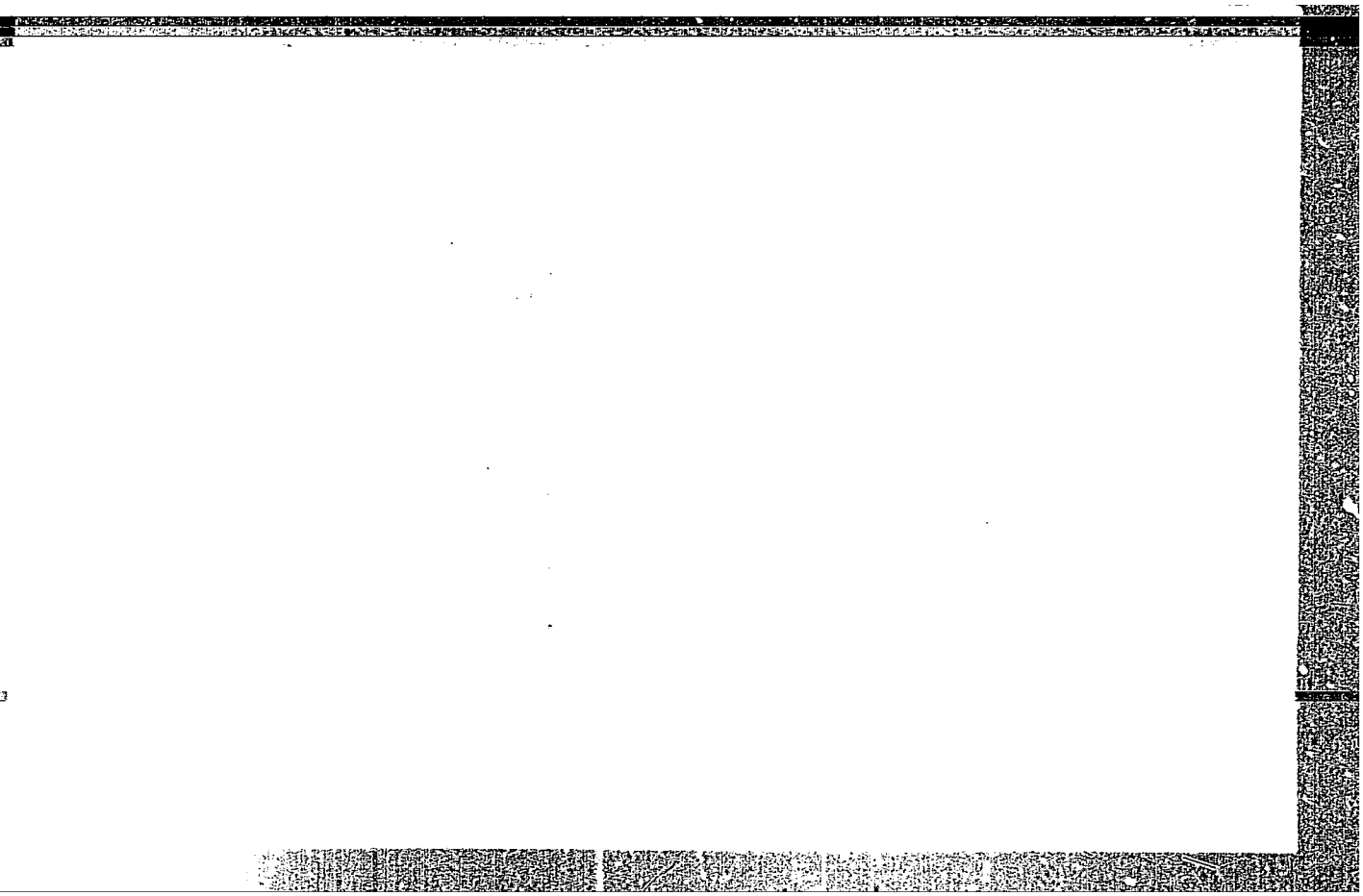

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SOV/28-59-10-4/36

9(2), 25(1,5)
AUTHORS: Valesyan, Sh.G., and Koganskiy, S.D.

TITLE: Working ... of Parametric Series for Electric Executive Devices

PERIODICAL: Standartizatsiya, 1959, Nr 10, pp 17-19 (USSR)

ABSTRACT: In the current seven years, production in machine-building and metal-working industry will be doubled. In this connection, construction of normal machines and devices acquires a great importance. The 1959-1960 Plan provides for compilation of work "Parametric Series of Electric Executive Devices for Regulation and Distance Control of Technical Processes (Output Parameters)"; it is to be worked out by the Special Construction Bureau of Standardization and Normalization TsNII of Complex Automation (SKBSN TsNIIKA). Electric executive mechanisms are power designs incorporated into the systems of automatic regulation and remote control over-production processes. The constant speed executive devices are at present manufactured according to their output para-

Card 1/3

... devices according to

Working Out of Parametric Series for Electric Executive Devices

their output parameters (see Table on p 18). The project of SKBSN provides only for a parametric series for torque, time of one turn, and for the number of turns of the output device depending on the type of executive mechanism. However, these standards are not sufficient for a correct evaluation of the full volume of work when constructing executive devices. This part of the project needs to be completed. Working out parametric series for electric executive devices will permit a decrease in their diversity and variety, and speed up the process of computing constructions of new electric executive devices. There is 1 table.

Card 3/3

S/119/60/000/009/008/008
B012/B058

AUTHORS: Valesyan, Sh. G., Koganskiy, S. D.

TITLE: Rational Kinematic Diagrams of Electric Switching Crank Gears

PERIODICAL: Priborostroyeniye, 1960, No. 9, pp. 30-31

TEXT: Work concerning the selection of a rational kinematic diagram for the series of electric switching mechanisms of the crank-gear type is conducted at present at the SKB "Avtomatika" (SKB "Automation") at Kirovokan. A short summary of the results achieved so far is given in the present paper. The electric switching crank gear consists of an electric motor, a gear, and an additional device. The guarantee of self-locking and greatest efficiency is one of the principal conditions for the gear. It is pointed out that all the electric switch mechanisms manufactured at home and abroad can be subdivided into two groups according to their kinematic characteristics. These are described here in short. In the first group (Fig. 1), power transmission to the crank at the exit takes place with the aid of two worm gears. The two variants possible for manual drive

Card 1/2

Rational Kinematic Diagrams of Electric Switching Crank Gears

S/119/60/000/009/008/008
B012/B058

are shown (Figs. 1a and 1b) and described. A worm gear (Fig. 2) is sufficient for a short response time (1-60 seconds). In the second group, power transmission from motor to crank takes place with the aid of some pairs of spur gears (Fig. 3). It is pointed out that it is appropriate to combine the positive properties of both groups. Such a construction is shown in Fig. 4. Power transmission for the latter takes place with the aid of some pairs of spur gears and a worm gear at the exit. This variant is highly efficient and corresponds to the self-locking conditions. A further variant of a switching mechanism with a manual drive is shown in Fig. 5. This drive is built in the form of a "differential", and is combined with a device for limiting the maximum load (Fig. 5a). The construction shown in Fig. 5b is described as being most promising. A planetary gear with two internal teeth, combined with a two-sided overrunning clutch, is used here. There are 5 figures.

Card 2/2

KOGANSON, B.M.

Long-range gas jet in blast burners employing external mixing. Gaz. prom. 7 no.6:33-34 '62.

Using a ceramic grid in forges with gas heating. Ibid.:34
(MIRA 17:6)

KOGANSON, B.M.

Design of a gas-fired hearth. Gaz. prom. 10 no.8:28-29 '65.
(MIRA 18:9)

KOGANZON, O., inzhener; SERGEYKIN, B., inzhener.

Heating pipes by means of eddy currents. Zhil.-kom. khoz. 3 no.11: 25-26 [N]'53. (MLRA 6:12)
(Gaspipes)

(-SUN, Sh.M.

Translation from: Referativnyy zhurnal, Metallurgiya, 1958; Nr 1, p 85 (USSR) 137-1958-1-532

AUTHOR: Koganzon, Sh. M.

TITLE: Standardization and Mechanization of the Recasting of Type Metal (K voprosu o normalizatsii i mekhanizatsii pereplavki tipografskikh splavov)

PERIODICAL: Sb. tr. Ukr. n.-i. in-t poligr. prom-sti. 1956, Vol 4, pp 95-103

ABSTRACT: A process manual on the preparation and recasting of type metal for the printshops of the Ukraine has been developed. The manual presents a table of grades of type metal, their composition in accordance with GOST (All-Union Standards), and temperature conditions for recasting. Chemicals to be used in cleaning type metals of impurities and methods of modifying them in accordance with analytical findings are recommended, while measures to reduce casting waste and other losses of metal are indicated.

Card 1/1 1. Type metal--Recasting 2. Type metal--Preparation G.S.

85-57-12-6/29

AUTHOR: Koganzon, Ts., Leader, Model-airplane Builder's Team of KhTZ Children's Club

TITLE: Model Airplane Builders of the KhTZ (Aviamodelisty KhTZ)

PERIODICAL: Kryl'ya rodiny, 1957, Nr 12, p 6 (USSR)

ABSTRACT: A photograph shows two model-airplane builders, members of the Children's Club of the Khar'kovskiy traktornyy zavod (Khar'kov Tractor Plant).

ASSOCIATION: Khar'kovskiy traktornyy zavod (Khar'kov Tractor Plant)

AVAILABLE: Library of Congress

Card 1/1 1. Photograph

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23846
S/020/61/137/006/005/020
B104/B201

AUTHOR: Kogarko, B. S.

TITLE: Model of a cavitating liquid

PERIODICAL: Doklady Akademii nauk SSSR, v. 137, no. 6, 1961, 1331-1333

TEXT: A description is given of a model of a medium that may be designated, in some approximation, as a cavitating liquid. Expansion and compression of the bubbles are described by the usual equations of hydrodynamics. The beginning of cavitation depends essentially on the existence of strange particles (cavitation nuclei) in the liquid, the size of which is 10^{-3}-10^{-5} cm. In the model under consideration, the cavitation nuclei are taken to be spheres of equal diameter, and to be distributed uniformly over the entire volume of the incompressible liquid with density ρ_0. Cavitation bubbles will be formed in the liquid only if the pressure is below p_{cr}. Pressure p_{cr} is assumed to remain constant in the bubbles with expansion and compression of the latter. The radial motion of all bubbles obeys the same as does the motion of a single spherical cavity with constant

Card 1/5

Model of a cavitating liquid

internal pressure in an infinite volume of the incompressible liquid. Then, for each individual bubble,

$$R\frac{d^2R}{d\tau^2}+\frac{3}{2}\left(\frac{dR}{d\tau}\right)^2=\frac{p_{\text{кр}}-p}{\rho_0}, \qquad (1),$$

where R denotes its radius at the time τ, and p is the pressure of the liquid. It is further assumed in this model that mixtures of vapor and liquid are a homogeneous medium with a mean density. The latter can then be described by

$$\rho=\frac{\rho_0}{1+b\left(R^3-R_0^3\right)}, \quad b=\frac{4}{3}\pi n\rho_0. \qquad (2).$$

From these two equations it is possible to derive the function $p = f(\varrho, d\varrho/dt, d^2\varrho/dt^2)$, which, together with the continuity equation and the equation of conservation of momentum, constitutes a closed system of equations. The free energy F can be defined as follows:

$$F\left(R,\frac{dR}{d\tau},T\right)=\frac{3b}{2}R^3\left(\frac{dR}{d\tau}\right)^2-\frac{b}{\rho_0}p_{\text{кр}}R^3+\varphi(T), \quad S=-\frac{\partial F}{\partial T} \qquad (4).$$

Card 2/5

It is easy, on the basis of this system, to generalize the model taking account of the surface tension, viscosity, and change of pressure in the bubbles. The linear, steady motion of a liquid through a tube with local narrowings is finally dealt with. If the cross section in a zone of this tube is larger than a given minimum cross section S_{min}, the pressure in that zone will drop to below p_{dr}. Equations

$$\rho U \frac{dU}{dx} = -\frac{dp}{dx},$$
$$QuS = Q = Q_0 u_0 S_0, \qquad (6)$$
$$p = \frac{p_0}{1 + b(R^3 - R_0^3)},$$
$$u^2\left[R\frac{d^2R}{dx^2} + \frac{3}{2}\left(\frac{dR}{dx}\right)^2\right] + uR\frac{du}{dx}\frac{dR}{dx} = \frac{p_{kp} - p}{\rho_0},$$

hold for such a zone. Here, u denotes the flow velocity, and Q is the liquid consumption. These equations have been numerically integrated for

Card 3/5

Model of a cavitating liquid

S/020/61/137/006/005/020
B104/B201

the case of the cross section being a function of x, thus $S(x) = k_0x^2 + k_1$. It has been found that, beginning from the initial value R_0, the bubbles attain a determined maximum size, and subsequently become smaller. The bubbles, furthermore, display a tendency toward a steady growth. This corresponds to the case of a supersonic flow through a nozzle. It has therefore not been possible to set up a continuous solution at the tube outlet for an arbitrary pressure, p_2. It has been found necessary to introduce a compression jump coinciding with the boundary of the region of cavitation. The coordinates of the compression jump are related to the pressure as follows:

$$p_{xp} - p_2 + \frac{\rho_0 u_0^2}{2}\left[1 - \left(\frac{S_0}{S_2}\right)^2\right] = b\rho_0 u_0^2 S_0^2 \int_{x_0}^{x_c} \frac{R^3 - R_0^3}{S^3}\frac{dS}{dx}\,dx. \qquad (9).$$

This relation is obtained by integration of the first equation of system (6), taking account of the compression shock. The expression at the right-hand side expresses the energy loss arising with cavitation. L. I.

Card 4/5

ACCESSION NR: AP4030779 S/0020/64/155/004/0779/0782

AUTHOR: Kogarko, B.S.

TITLE: One dimensional nonstationary motion of a fluid with the formation and development of cavitation

SOURCE: AN SSSR. Doklady*, v. 155, no. 4, 1964, 779-782

TOPIC TAGS: fluid cavitation, nonuniform fluid motion, hydromechanics cavitation, fluid motion

ABSTRACT: The cavitation bubbles formed in the vicinity of a vibrator located in water appear, and almost completely disappear during each vibration cycle. The author discusses the formation of a cavitation region in a fluid in the vicinity of a nonuniformly moving piston under the assumption that the motion of the cavitating fluid is described by the system of equations previously suggested by the author (DAN 137, no. 6, 1961). These equations describe the relationship between pressure, density, and the velocity of the fluid, and the number and radii of the bubbles (per unit volume). It follows that, under certain assumptions, there is in

Card 1/2

ACCESSION NR: AP4030779

the cavitation region an inverse proportionality between pressure and density, and that therefore the progressing wave does not change its form. The pressure in the wave is practically independent of the presence of cavitation bubbles, and it follows the usual acoustical expression. Orig. art. has: 2 figures and 14 equations.

ASSOCIATION: Naucho-issledovatil'skiy institut mekhaniki Moskovskogo gosadarstvennogo universiteta im. M.V. Lonionosova (Research Institute for Mechanics of the Moscow State University)

SUBMITTED: 20Dec63 / DATE ACQ: 30Apr64 ENCL: 00

SUB CODE: Ph NR REF SOV: 001 OTHER: 001

Card 2/2

AUTHOR: Kogarko, L. N.

TITLE: The Distribution of Alkaline Elements and of Thallium in the Granitoids of the Turgoyak Massif (Central Ural) (Raspredeleniye shchelochnykh elementov i talliya v granitoidakh Turgoyakskogo massiva (Sredniy Ural))

SOV/7-59-5-8/14

PERIODICAL: Geokhimiya, 1959, Nr 5, pp 455 - 462 (USSR)

ABSTRACT: The Turgoyak massif was not formed by magmatic differentiation, but by the reaction of a melt the composition of which corresponded to the leucocratic granite in the center, with gabbro-peridotitic rocks. The transition from leucocratic granite over biotite granite to granodiorite is shown by the integration analyses of thin sections (Table 1) and the increasing iron content of biotites and hornblendes (Table 2). The alkaline elements Li, Na, K, Rb were determined flame photometrically under the supervision of D. I. Ivanov, Pochvennyy in-t AN SSSR (Soil Institute AS USSR), and by V. I. Lebedev, Institut geokhimii i analiticheskoy khimii im. V. I. Vernadskogo AN SSSR (Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy AS USSR). Tl was determined according to the method of N. T. Voskresenskaya (Ref 4); the

Card 1/2

author thanks her for her advice in this analysis. The results are given in table 1, and graphically represented in figure 1. The contents of all elements determined increase from leucocratic granite up to biotite granite and are reduced in the case of the transition from biotite granite to granodiorite. Only Li is an exception in the last case. The alkali were transported on in the formation of the massif; thallium is enriched on the surface in consequence of its greater mobility: in the center the Rb/Tl ratio is reduced in the leucocratic granite from 180 to 70 in granodiorite. There are 1 figure, 3 tables, and 13 references, 10 of which are Soviet.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: January 5, 1959

KOGARKO, L.N.

Conditions of villiaumite formation in nepheline syenites (Lovozero Massif). Geokhimiia no.1: 72-74 '61. (MIRA 14:3)

1. V. I. Vernadskiy Institute of Geochemistry and Analytical Chemistry, Academy of Sciences, U.S.S.R., Moscow.
(Lovozero Tundras--Villiaumite)

KOGARKO, L.N.

Chlorine-free schairerite from nepheline syenites of the Lovozero Massif (Kola Peninsula). Dokl. AN SSSR 139 no.2:435-437 Jl '61. (MIRA 14:7)

1. Institut geokhimii i analiticheskoy khimii im. V.I. Vernadskogo AN SSSR. Predstavleno akademikom A.P. Vinogradovym.
(Lovozero Tundras--Schairerite)

KOGARKO, L.N.; RYABCHIKOV, I.D.

Relationship between the content of halogen compounds in the gas phase and the chemistry of magmatic melt. Geokhimiia no.12:1068-1076 '61. (MIRA 15:3)

1. Vernadskiy Institut of Geochemistry and Analytical Chemistry, Academy of Sciences U.S.S.R., Moscow and the Institute of Ore Deposits, Petrology, Mineralogy and Geochemistry, Moscow.
(Halogen compounds) (Magma)

VALYASHKO, V.M.; KOGARKO, L.N.

Inclusions in the apatites of the Khibiny and Lovozero Massifs. Dokl. AN SSSR 166 no.1:202-205 Ja '66. (MIRA 19:1)

1. Institut geokhimii i analiticheskoy khimii im. V.I.Vernadskogo AN SSSR. Submitted July 20, 1965.

L.N. KOGARKO; V.P. VOLKOV (USSR)

"Physico-chemical evolution of alkaline magma in differentiated complex of Lovorzero massif in connection with its rhythmical stratification.

Report presented at the Conference on Chemistry of the Earth's Crust, Moscow, 14-19 Mar 63.

KOGARKO, L.N.

Distribution of fluorine in nepheline syenites of the Lovozero Tundras (Kola Peninsula). Geokhimiia no.4:318-329 '62. (MIRA 16:7)

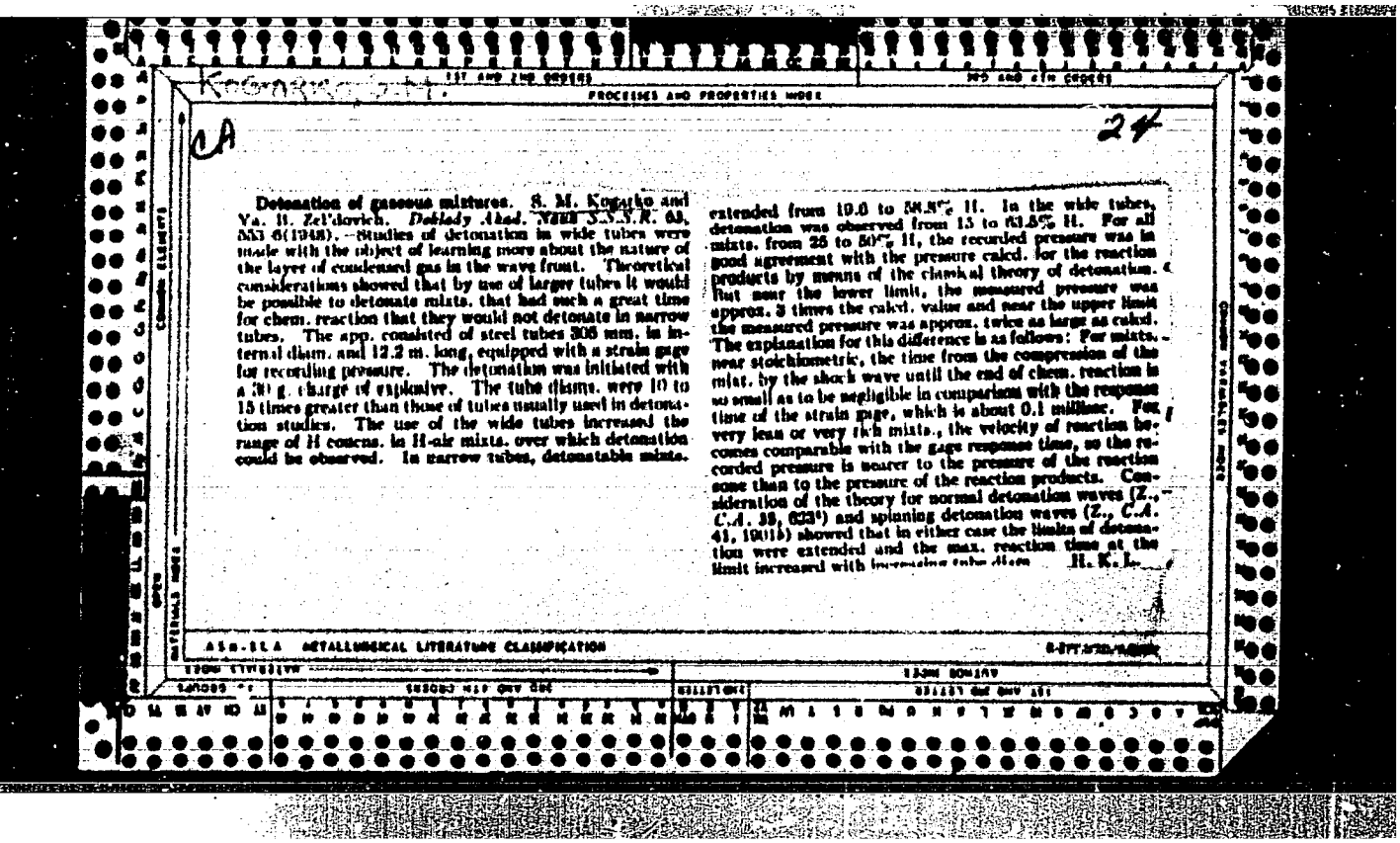
1. Vernadsky Institute of Geochemistry and Analytical Chemistry, Academy of Sciences, U.S.S.R., Moscow.
(Lovozero Tundras--Nepheline syenite)
(Lovozero Tundras--Fluorine)

RYABCHIKOV, I.D.; KOGARKO, L.N.

Effect of anion substitution on the acidity of magmatic melts. Geokhimiia no.3:305-311 Mr '63. (MIRA 16:9)

1. Institute of Geology of Ore Deposits, Petrology, Mineralogy and Geochemistry and V.I.Vernadsky Institute of Geochemistry and Analytical Chemistry, Academy of Sciences of the U.S.S.R., Moscow.

(Anions) (Magma--Analysis)

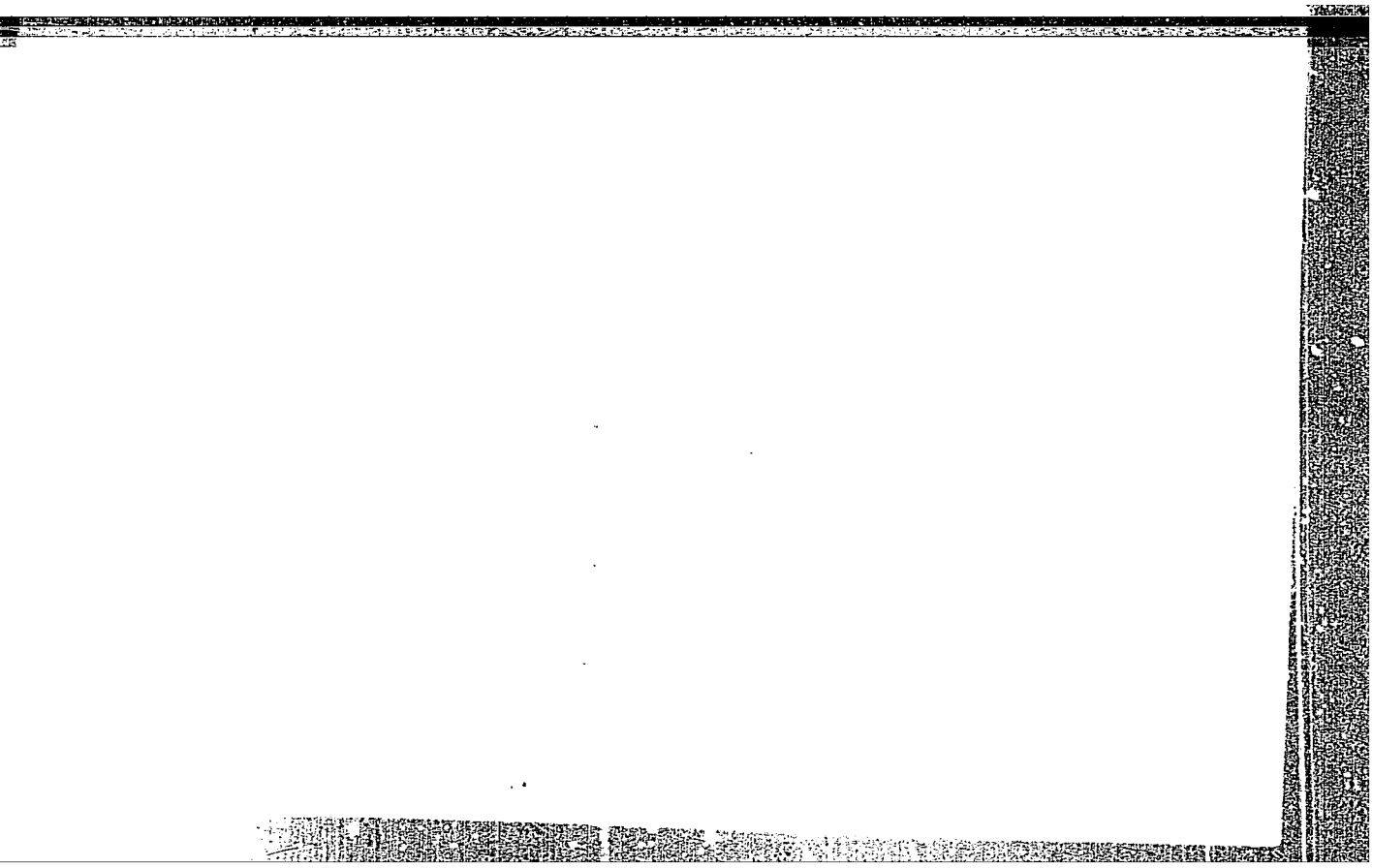


PROCESSES AND PROPERTIES INDEX

24

Detonation of gaseous mixtures. S. M. Kogarko and Ya. B. Zel'dovich. *Doklady Akad. Nauk S.S.S.R.* 63, 553-6(1948).—Studies of detonation in wide tubes were made with the object of learning more about the nature of the layer of condensed gas in the wave front. Theoretical considerations showed that by use of larger tubes it would be possible to detonate mixts. that had such a great time for chem. reaction that they would not detonate in narrow tubes. The app. consisted of steel tubes 305 mm. in internal diam. and 12.2 m. long, equipped with a strain gage for recording pressure. The detonation was initiated with a 30 g. charge of explosive. The tube diams. were 10 to 15 times greater than those of tubes usually used in detonation studies. The use of the wide tubes increased the range of H concns. in H-air mixts. over which detonation could be observed. In narrow tubes, detonatable mixts. extended from 19.0 to 58.8% H. In the wide tubes, detonation was observed from 13 to 63.5% H. For all mixts. from 25 to 50% H, the recorded pressure was in good agreement with the pressure calcd. for the reaction products by means of the classical theory of detonation. But near the lower limit, the measured pressure was approx. 3 times the calcd. value and near the upper limit the measured pressure was approx. twice as large as calcd. The explanation for this difference is as follows: For mixts. near stoichiometric, the time from the compression of the mixt. by the shock wave until the end of chem. reaction is so small as to be negligible in comparison with the response time of the strain gage, which is about 0.1 millisec. For very lean or very rich mixts., the velocity of reaction becomes comparable with the gage response time, so the recorded pressure is nearer to the pressure of the reaction some than to the pressure of the reaction products. Consideration of the theory for normal detonation waves (Z., *C.A.* 33, 623[4]) and spinning detonation waves (Z., *C.A.* 41, 1911b) showed that in either case the limits of detonation were extended and the max. reaction time at the limit increased with [illegible] H. K. L.

ASB-ELA METALLURGICAL LITERATURE CLASSIFICATION

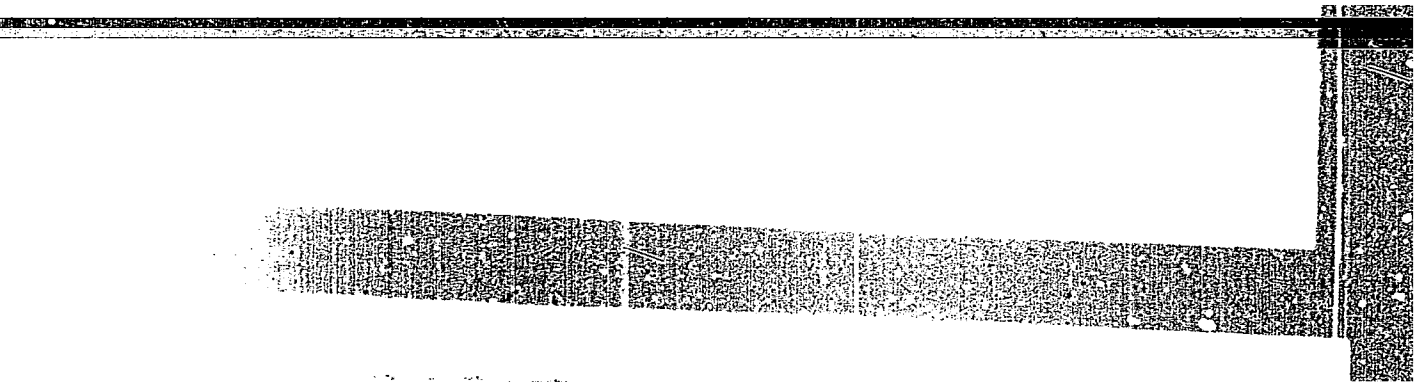


APPROVED FOR RELEASE: 09/18/2001 CIA-RDP86-00513R000723620008-3"

KOGARKO, S.M.

Possible detonation of gaseous mixtures in conical tube. Izv.AN SSSR.Otd.khim.nauk no.4:419-426 Ap '56. (MLRA 9:8)

1. Institut khimicheskoy fiziki Akademii nauk SSSR.
(Explosions)



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APPROVED FOR RELEASE: 09/18/2001 CIA-RDP86-00513R000723620008-3"

AUTHOR KOGARKO, S.M., PA - 2812

TITLE Investigation of Pressure Due to Fuel-Oxygen Mixture Detonation by the Method of the "Throw of Pivot"
(Issledovaniye davleniya metodom otletayushchego sterzhnya pri detonatsii toplivo-kislorodnykh - Russian)

PERIODICAL Zhurnal Tekhn. Fiz., 1957, Vol 27, Nr 4, pp 833-843, (U.S.S.R.)

Received 5/1957 Reviewed 6/1957

ABSTRACT In order to obtain new data on the amount of pressure in an explosion wave on the occasion of the detonation of gaseous explosion mixtures, the method developed by Hopkinson B. (Phil.Trans.Roy.Soc., A, 213, 437, 1914) was applied with a few modifications and improvements. The basis of this method, the experimental plant, the pressure gauge and the method of calculation are described. The rise of the rod as well as the amount of motion conveyed by the rod and the average pressure during the time the shock wave needs to cover a distance which is twice a long as the thrown pivot are determined according to the maximum deviation of the thrown pivot in the course of the experiment. Reflection pressure was investigated in the case of detonations of fuel-oxygen mixtures, hydrogen-, oxygen-, propane-oxygen-, methane-oxygen- as well as methane-oxygen-nitrogen-mixtures. The experiments show that in the case of a detonationof fuel-oxygen mixtures a zone exists in the detonation wave in which pressure is higher than the pressure in the Zhuge-point of the explosion products. The maximum values of reflection pressure in

Card 1/2

AUTHOR: Kogarko, S. M.

SOV/57-28-9-27/33

TITLE: Investigation of the Tube End Pressure in a Non-stationary Fast Combustion (Issledovaniye davleniye v tortse truby pri nestatsionarnom bystrom gorenii)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1958, Vol 28, Nr 9, pp. 2041-2045 (USSR)

ABSTRACT: This is an examination of the pressure versus time function found at the front of the tube in the case of a non-steady and a fast combustion of a propane-air mixture. If the initial pressure $P = 1$ kg/cm^2 the maximum pressure at the front of the tube reaches $P = 470$ kg/cm^2. When the previously compressed mixture is ignited the maximum pressure developing at the front of the tube considerably exceeds the reflection pressures obtained by an explosion of the same power fuel mixed with oxygen, which may be the case when the shock wave is reflected in a non-steady fast combustion of a power fuel-air mixture. There are 2 figures, 1 table, and 3 references, 3 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR, Moskva (Institute of Chemical Physics AS USSR, Moscow)

Card 1/2

AUTHOR: Kogarko, S. M.

SOV/57-28-9-31/33

TITLE: Detonation of Air-Methane Mixtures and the Detonation Limits of Hydrocarbon-Air Mixtures in a Large Diameter Tube (Detonatsiya metano-vozdushnykh smesey i predely detonatsii uglevodorodo-vozdushnykh smesey v trube bol'shogo diametra)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1958, Vol 28, Nr 9, pp. 2072-2083 (USSR)

ABSTRACT: In this paper the problem is approached of the relation between the velocity of the chemical reaction in a gas mixture in a detonation wave and the heat loss in the reaction zone on the one hand and the propagation velocity of the detonation wave and the detonation concentration limits on the other. This problem was first investigated in papers by research workers of the laboratory of combustion processes of the association mentioned at the bottom of this paper. The experimental equipment which was used in the experiments is described. It was built in the course of the study. The experimental evidence leads to the following conclusions: 1) Methane-air mixtures can be detonated a tube with a large diameter (305 mm) in a wide range of methane concentrations. The limit concentrations at this diameter are: a) lower limit 6.3% of CH_4 in air, b) upper limit 13.5% of CH_4

Card 1/3

in air. 2) It was found that a) methane-air mixtures do not detonate in a narrow tube (20 mm) at an arbitrary methane content within the limit detonation concentrations. This does not occur even if a strong shock wave is injected (which is produced by the explosion of the detonator cap Nr 8 in the mixture). b) A wave propagating in a steady state in a wide diameter tube is destroyed when it passes into a tube with a smaller diameter containing the same mixture. This tube may be attached in parallel or in series to the large diameter tube. 3) It was substantiated experimentally that the limit detonation concentrations and the possibility of a detonation in gas mixtures with a slow chemical reaction is dependent upon the tube diameter. This phenomenon is explained theoretically. 4) It is shown that the detonation limits of gasoline and of benzene-air mixtures in a large diameter tube the limit concentrations are considerably widened in comparison to those determined for 20 mm diameter tubes. A benzene-air mixture detonates under the prevailing experimental conditions in a concentration range specified by the composition coefficient α varying from 0,5 to 1,82. There are 8 figures, 2 tables, and 16 references, 9 of which are

Detonation of Air-Methane Mixtures and the Detonation Limits of Hydrocarbon-Air Mixtures in a Large Diameter Tube

SOV/57-28-9-31/33

Soviet.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR, Moskva (Institute of Chemical Physics, AS USSR, Moscow)

Card 3/3

AUTHORS: Kogarko, S. M., Skobelkin, V. I.

SOV/20-120-6-32/59

TITLE: Relaxation Interaction Between Shock Waves and the Combustion Zone (Relaksatsionnoye vzaimodeystviye udarnykh voln s zonoy goreniya)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 120, Nr 6, pp 1280 - 1283 (USSR)

ABSTRACT: The paper under review presents an investigation of the influence of the kinetics of the combustion upon the structure and the intensity of a shock wave when it passes through the combustion zone. The relaxation time t_r (the period during which no noticeable influence is exerted upon the diffusion currents and the heat currents in the reaction zone by the reaction conditions suddenly modified by the shock wave) is of the same order as the reaction period τ (10^{-3} - 10^{-5} sec). τ is defined as the ratio of the width of the combustion zone l and the normal expansion velocity of the flame. During t_r the temperature and the pressure within the reaction zone increase. During the relaxation time the excess momentum in the

Card 1/3

reaction zone is transformed into a shock wave propagating forward and backward from the reaction zone. Equations giving the state in the shock wave are written down. The whole amount of heat liberated in the passage of the shock wave is expended for the increase of the internal energy of the gas in the reaction zone. τ_b denotes the duration of the passage of the shock wave through the combustion zone. If $\tau \gg \tau_b$ the reaction is not completed during the passage of the wave through the front of the flame and only a certain proportion of the chemical energy which is expended for the increase of the momentum of the wave is imported to the wave. If $\tau \lesssim \tau_b$ the reaction is completed within the period τ. The total momentum of the shock wave after passing the combustion zone is combined from the interest momentum I and the relaxation momentum I_r. The maximum amplification of the momentum of the shock wave at $\tau = \tau_b$ may be termed momentum resonance. Finally a method for the determination of the index of refraction is presented.

Relaxation Interaction Between Shock Waves and the Combustion Zone SOV/20-120-6-32/59

There is 1 figure.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, AS USSR)

PRESENTED: March 6, 1958, by N. N. Semenov, Member, Academy of Sciences, USSR

SUBMITTED: February 25, 1958

1. Shock waves--Analysis 2. Combustion--Analysis 3. Mathematics --Applications

Card 3/3

5(4), 10(7)

AUTHORS: Kogarko, S. M., Skobelkin, V. I., Kazakov, A. N.

SOV/20-122-6-25/49

TITLE: The Interaction Between Shock Waves and the Front of a Flame (Vzaimodeystviye udarnykh voln s frontom plameni)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 122, Nr 6, pp 1046-1048 (USSR)

ABSTRACT: The present paper investigates the intensification of shock waves in their interaction with the front of a flame by variation of the normal combustion process in the shock wave. The length of the shock wave is assumed to be sufficient in the direction of the reaction zone. For the interaction between such a shock wave and the flame front the following applies: 1) The shock wave is transformed at the flame front (like on the boundary dividing two media). In this way a refracted and a reflected wave are formed. The flame front can by approximation be considered to be a contact-discontinuity. The expressions for the refraction coefficient are written down. 2) When passing through the flame front the shock wave compresses the gas in the reaction zone, whereby temperature rises. This temperature rise increases reaction velocity, so

Card 1/3

that the propagation velocity of the flame is also increased. This propagation velocity increases very rapidly, and therefore this process may be looked upon as a sort of explosion in the gas current behind the shock wave; it causes the formation of 2 additional (intensifying) shock waves. The shock wave front moves with subsonic velocity in relation to the disturbed gas, and therefore any kind of disturbance is able to catch up with this front in the current behind the shock front, thus changing its structure. The propagation velocity of the flame is not increased immediately upon arrival of the shock wave, but only after a certain relaxation time. The latter is of the same order of magnitude as the duration of reaction. A diagram schematically shows the intensification of the shock wave when passing through the flame front. Expressions for shock front calculation are given. The new propagation velocity of the flame is calculated according to the theory developed by Zel'dovich. The amplitude of the intensifying shock wave depends upon the amplitude of the initial shock wave as well as on the kinetic properties (reaction velocity, calorific value, activation energy, etc.) of the fuel. The second diagram shows the amplitude of the inten-

The Interaction Between Shock Waves and the Front of a Flame

sifying shock wave of compression in the reaction zone for 2 different propagation velocities. There are 2 figures and 5 Soviet references.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute for Chemical Physics of the Academy of Sciences, USSR)

PRESENTED: June 21, 1958, by V. N. Kondrat'yev, Academician

SUBMITTED: June 11, 1958

Card 3/3

KOGARKO, S.M.

17(1); 10(2); 24(8) PHASE I BOOK EXPLOITATION SOV/2541

Akademiya nauk SSSR. Energeticheskiy institut

Goreniye v turbulentnom potoke; diskussiya na obshchemoskovskom seminare po goreniyu pri energeticheskom institute AN SSSR (Combustion in Turbulent Flow; a Discussion in the All-Moscow Seminar at the Power Engineering Institute, USSR Academy of Sciences) Moscow, Izd-vo AN SSSR, 1959. 167 p. Errata slip inserted. 2,000 copies printed.

Ed.: L. N. Khitrin, Corresponding Member, USSR Academy of Sciences; Eds. of Publishing House: R. I. Kosykh and M. M. Knoroz; Tech. Ed.: P. S. Kashina.

PURPOSE: This collection is intended for research scientists in the fields of thermodynamics and fluid mechanics.

COVERAGE: The collection contains six papers which present the results of experimental and theoretical research on combustion phenomena under conditions of turbulent flow.

Card 1/6

TABLE OF CONTENTS:

Card 2/6

Vlasov, K. P. Experimental Investigation of the Combustion Zone of a Turbulent Flame (Supplement to Ye.S. Shchetinkov's Report)

This paper gives details of the test setup and some results of an experimental study of the combustion zone in a turbulent flame. The test method was based on small-lag measurements of the ionized current and the temperature. Experimental data on the distributions of the ionized current and the temperature are given and the measured statistical characteristics of these quantities are presented as functions of the depth of the combustion zone and the flow velocity.

Kogarko, S. M. On the Model for Combustion in a Turbulent Flow 58

On the basis of the Damkoehler-Shchelkin hypothesis, this paper considers the mechanism of the combustion of a homogeneous mixture in turbulent motion in the cross section of a tube. The stabilization of the flame tongue is achieved with the aid of a pilot flame. The author questions the validity of the model of combustion proposed by Shchetinkov in the first paper in this collection.

Card 3/6

SOV/24-59-2-2/30

AUTHORS: Basevich, V. Ya., Kogarko, S. M. (Moscow)

TITLE: The Structure of Turbulent Flames of Homogeneous and Heterogeneous Mixtures (O strukture turbulentnogo plameni gomogennykh i geterogennykh smesey)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1959, Nr 2, pp 13-20 (USSR)

ABSTRACT: It is known that unreacted fuel can be detected in the jet of a turbulent flame, and even in the products of combustion. This supports existing pictures of the possible mechanism of turbulent flames, for instance, the surface model (Refs 1, 2), but insufficient quantitative evidence is at present available. The purpose of the paper is to study the temperature and concentration of the fuel and the velocity of combustion in turbulent flames, thus permitting an approach to the problem of their structure. The apparatus (Fig 1) consists essentially of an air heater (1), a tube (2) in which the fuel (benzene or kerosene) is mixed with the air, a combustion chamber (6) and a burner (7); the amount of vapour phase was measured by a special device (9-16). With this apparatus the completeness of combustion (η) of homogeneous mixtures was measured as a function of the length (L) of the combustion zone; η is defined by

Card 1/3

The Structure of Turbulent Flames of Homogeneous and Heterogeneous Mixtures

the equation:

$$\eta = I - C/C_o \qquad (1)$$

where C_o is the initial concentration of benzene, and C is the concentration at a given point. In heterogeneous mixtures, the completeness of combustion was studied in relation to the size of the drops of atomised fuel. It is concluded that with homogeneous mixtures at 1 atmosphere pressure and temperature $\leqslant 125^{\circ}C$ there is a change of fuel concentration and a corresponding increase in the products of combustion with a conversion time <1 msec; the temperature of the air-fuel mixture in the combustion zone is near to its initial temperature. With heterogeneous mixtures and fuel drops of diameter 180-100 μ, the change in group diameter is satisfactorily described by Eq (1). For smaller drops ($\ll 80\mu$), Eq (1) has to be modified to allow for the

The Structure of Turbulent Flames of Homogeneous and Heterogeneous Mixtures

probability of ignition and combustion of the drops. There are 12 figures, 2 tables and 5 references, 3 Soviet, 1 German and 1 English.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics, Academy of Sciences, USSR)

SUBMITTED: October 27, 1958.

KOGARKO, S.M.

Investigation of the pressure of the detonation wave by the crushed compression method. Zhur.tekh.fiz. 29 no.1:128-140 Ja '59.
(MIRA 12:4)

(Shock waves) (Explosives)

05838
SOV/76-33-10-36/45

5(4) 11(1)
AUTHORS: Kogarko, S. M., Devishev, M. I., Basevich, V. Ya.

TITLE: An Investigation of the Ignition of Gases in the Reaction Products of a Flame

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 10, pp 2345 - 2350 (USSR)

ABSTRACT: The authors investigated the retardation of ignition in mixtures of air and methane, n-butane, isooctane, (2,2,4-trimethyl pentane), and n-heptane which resulted from the combustion products of a diffusion-gas burner. For this purpose, they used a chamber which had been heated to 500-1500° at 1 atm electrically and by the combustion products of the diffusion flame. Experiments were made in an apparatus (Fig 1) which permitted automatic recording of the ignition retardation as well as an alteration of the distance between the flame and the gas entrance. Further, the absorption spectra of the hydroxyl groups were taken by means of an ISP-22 spectrograph, and the spectrogram was evaluated on an MF-2 microphotometer. The method by V. N. Kondrat'yev (Ref 2) was used to interpret the absolute concentration of the hydroxide. Results of calculation are listed in a table.

Card 1/3

An Investigation of the Ignition of Gases in the Reaction Products of a Flame

05838
SOV/76-33-10-36/45

It was found that within the temperature range 550-1150°C the ignition was retarded by 2-200 msec at 1 atm and depended greatly on the initial concentration of the active particles (OH radicals), i. e. a variation by one order (or more) may take place at the same temperature. The retardation of ignition is largely dependent on the distance between the gas entrance and the flame since the concentration of the OH radicals is reduced at a larger distance. It is assumed that a reduction of the apparent activation energy may be explained by an increase in the concentration of the active particles (especially of the hydroxyl). Under conditions similar to those of combustion in a turbulent gas flow (up to 1000 K) the retardations of ignition are longer than the time in which the gas remains in the zone of combustion of the hydrocarbon-air mixture. Consequently, it is assumed that combustion according to a homogeneous mechanism may be neglected in this zone since in this zone combustion obviously proceeds according to the mechanism of flame spreading. Publications by B. P. Mullin (Ref 3) and H. Sachsse (Ref 4) are mentioned here. There are 5 figures, 1 table, and 5 references,

Card 2/3

05838

An Investigation of the Ignition of Gases in the Reaction Products of a Flame

SOV/76-33-10-36/45

2 of which are Soviet.

ASSOCIATION: Akademiya nauk SSSR, Institut khimicheskoy fiziki, Moskva (Academy of Sciences of the USSR, Institute of Chemical Physics, Moscow)

SUBMITTED: April 3, 1958

Card 3/3

5(4)

SOV/20-127-1-37/65

AUTHORS: Kogarko, S. M., Devishev, M. I., Basevich, V. Ya.

TITLE: Investigation of the Influence of Active Particles of Reaction Products on the Burning Processes in a Flow (Issledovaniye vliyaniya aktivnykh chastits produktov reaktsii na protsessy goreniya v potoke)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 1, pp 137-140 (USSR)

ABSTRACT: Figure 1 shows the experimental system. A hydrogen flame burns in a tube with heated air flow. A gas (lighting gas, methane, n-butane, n-propane) is introduced at a variable distance from the flame. The temperature is measured, at which the gas ignites at a given distance from the hydrogen flame. The concentration drop of OH-particles with increasing distance from the hydrogen flame at various temperatures was determined spectroscopically (Table 1). Methane (Fig 2) at a distance of 150 mm from the hydrogen flame and an air flow rate of 25 m/sec ignites already at 500°, while ignition at a distance of 650 mm (and equal air flow rate) occurs only at 1000°. This is explained by the influence of the active particles (OH, atomic O and H) forming

Card 1/2

in the hydrogen flame. These particles gradually recombine behind the hydrogen flame. If a combustible gas is introduced into the tube section, in which the concentration of such particles is still high, chemical processes take place, which accelerate ignition. Owing to this, also in the case of the activating energy of methane, 19 or 71 kcal/mol, depending on the distance from the hydrogen flame, were found. There are 4 figures, 1 table, and 2 Soviet references.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences, USSR)

PRESENTED: January 20, 1959, by V. N. Kondrat'yev, Academician

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28379

S/124/61/000/008/030/042
A001/A101

11.7100

AUTHORS: Kogarko, S. M., Devishev, M. I., Basevich, V. Ya.

TITLE: Investigation of the effect of active particles from reaction products on burning processes in a flow

PERIODICAL: Referativnyy zhurnal, Mekhanika, no. 8, 1961, 75-76, abstract 8B526 (V sb. "3-ye Vses. soveshchaniye po teorii goreniya T. 1". Moscow, 1960, 72-78)

TEXT: The authors investigated experimentally the effect of active particles forming in hydrogen diffusion flame, on the ignition of combustible mixture, boundaries of flow separation, and the flame propagation velocity in a turbulent flow. Active particles were injected in the processes investigated with different time intervals after their formation, obtaining thereby their different concentrations. For this purpose, the hydrogen burner was placed in the main air flow at different distances of the process investigated. The temperature of the combustible mixture, turbulence of the flow and concentration of hydroxyl were recorded in experiments. The investigation of ignition has shown that at different distances of ignition spot from the diffusion burner, ignition occurs at different

Card 1/2

28379

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Investigation of the effect of active ...

temperatures and correspondingly, different ignition delays. The ignition temperature varied from 500 to 1,000°C for combustible mixtures of methane, normal butane, isooctane, normal heptane with air, and ignition delay varied from 2 to 200 sec. The results of measuring the boundaries of flow separation indicate that expansion of these boundaries occurs only at high concentrations of active particles. Injection of active particles increases also the velocity of flame turbulent propagation. Moreover, it was discovered that active particles enhance the flame luminosity. In poor mixtures intensity grew 3 times, and in rich ones by 50%. There are 15 references.

V. Librovich

[Abstracter's note: Complete translation]

Card 2/2

25416
S/137/61/000/006/005/092
A006/A101

11.735c

AUTHORS: Basevich, V.Ya., Kogarko, S.M.

TITLE: On some peculiarities of spray fuel combustion

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 6, 1961, 2, abstract 6B6 (V sb. "3-ye Vses. soveshchaniye po teorii goreniya, v. 2", Moscow, 1960, 40 - 47)

TEXT: Experiments were made on a device producing a turbulent air flow with sprayed fuel. The air velocity was varied from 10 to 55 m/sec, the temperature from - 25 to 200°C, the drop diameter from 10 to 350 μ, pressure was 1 atm. Photographs are presented showing the flame of sprayed fuel at various exposures. The time of existence in the turbulent combustion zone of fine drops may exceed by several times the combustion time of solitary drops. In the combustion zone of a turbulent flame the ignition and combustion of all the drops is not simultaneous. This can be taken into account if the combustion constant of individual drops, k, is multiplied by the function of combustion probability. The combustion mechanism is as follows: combustion of the fuel drops is accompanied by

Card 1/2

25416

On some peculiarities of spray fuel combustion

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the formation of individual and group zones; the value of constant k corresponds approximately to combustion of individual drops in the absence of convection; and the probability of combustion along the zone increases.

G. Glinkov

[Abstracter's note: Complete translation]

Card 2/2

80988

S/180/60/000/03/023/030

11.1000 E071/E333

AUTHORS: Basevich, V.Ya. and Kogarko, S.M. (Moscow)

TITLE: On the Probability Value of Combustion of Droplets of Injected Fuel in a Turbulent Stream

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Metallurgiya i toplivo, 1960, Nr 3, pp 121-126 + 1 plate (USSR)

ABSTRACT: An attempt was made to determine which factors influence the value of probability of combustion of droplets of sprayed fuel under various combustion conditions. The apparatus used (Figure 1) consisted of a compressor, electric heater for preheating air, fuel injector and a combustion chamber. The flame was stabilised by two pilot burners burning town gas (75% of methane). By varying the air temperature the proportion of vapour phase in the combustion mixture could be varied within wide limits. As fuel, benzene and paraffinic kerosene were used. The amount of vapour phase in the combustion mixture was recorded by a special apparatus (not described). The data on the number and size distribution of droplets were obtained by the printing method. The details of determining local composition of the combustion mixture, etc.

Card1/3

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E071/E333

On the Probability Value of Combustion of Droplets of Injected Fuel in a Turbulent Stream

were given in Ref 1. The photographs of the combustion zone were made by the method of optical compensation using a rotating mirror (Ref 2) with and without additional illumination with a mercury lamp. The experimental conditions are given in the table; the dependence of the concentration of droplets on their diameter for various cross-sections along the length of the combustion chamber - Figure 2; the dependence of group diameter of droplets during combustion on time - Figure 3; calculated values of probability of combustion on time - Figure 5; photographs of the combustion zone - Figure 4. It was found that an increase in the velocity of the stream and diameter of droplets somewhat decreases the value of the probability of combustion and an increase in the power of the stabilising pilot flames - increases it. The composition of the combustion mixture within the range of excess air coefficient $\alpha = 1.67 - 5.5$ has a strong influence on the probability of combustion, whereupon already at $\alpha = 1.67$ the probability of combustion approaches unity

Card2/3

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S/024/60/000/03/017/028
80954
E081/E441

AUTHORS: Basevich, V.Ya., Devishev, M.I. and Kogarko, S.M. (Moscow)

TITLE: Influence of Active Particles of Combustion Products on Flame Propagation Velocity in Turbulent Flow

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye tekhnicheskikh nauk, Energetika i avtomatika, 1960, Nr 3, pp 138-144 (USSR)

ABSTRACT: The apparatus is shown in Fig 1 (1 - tube, 2 - electric heater, 3 and 4 - hydrogen burners, 5 - rectifying device, 6 - mixer, 7 - jet, 8 - burner of pilot flame, 9 - stabiliser): the active particles were created by burning hydrogen either at 3 (distance (L) from tube section = 3000 mm) or at 4 (L = 400 mm). Experiments were carried out on town gas and propane. Fig 2 shows the temperature (1 and 1') and velocity (2 and 2') fields across the tube with the point 0 on the tube axis. Fig 3 is a photograph of propane flames (composition of mixture $\alpha = 1.4$, $T = 360°$, $Re = 50000$) and shows that the intensity and spread of the flame are both influenced by the concentration of active particles. Fig 4 shows the change in half-distance between maximum brightnesses (y)

Card 1/3

80954
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E081/E441

Influence of Active Particles of Combustion Products on Flame Propagation Velocity in Turbulent Flow

with distance along the flow axis (x), Fig 5 the influence of initial concentration of active particles on the velocity of flame propagation for mixtures of different constitution and Fig 6 the influence of initial concentration of active particles on the velocity of flame propagation at different temperatures; for Fig 4, 5 and 6 the working material was town gas. Fig 7 shows the influence of initial concentration of active particles on the flame propagation velocity in mixtures of different gases (town gas, propane and hydrogen) and Fig 8 the influence of initial concentration on the luminous intensity of the flames. The conclusions are: (1) The velocity of flame propagation in turbulent flow was increased by introducing an initial concentration of active particles from a burning reaction in the initial mixture. (2) Introduction of active particles increases the luminous intensity of the flame as a result of the increase in reaction velocity in the inception zone. There are 8 figures, 2 tables and 7 references, 4 of which are Soviet and 3 English.

Card 2/3

4

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E081/E441

Influence of Active Particles of Combustion Products on Flame Propagation Velocity in Turbulent Flow

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR
(Institute of Chemical Physics, Academy of Sciences USSR)

SUBMITTED: June 25, 1959

Card 3/3

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31304
S/124/61/000/010/C39/056
D251/D301

11.7100

AUTHORS: Borisov, A.A., Kogarko, S.M. and Lyubimov, A.V.

TITLE: On applying shock tubes to the investigation of chemical reactions

PERIODICAL: Referativnyy zhurnal. Mekhanika, no. 10, 1961, 91, abstract 10 B639 (Zh. prikl. mekhan. i tekhn. fiz., 1960, no. 3, 175-183)

TEXT: By the method of penumbral photoanalysis, the distribution is investigated of shock waves within a shock tube filled in one case with argon or nitrogen and in the other with the mixture 97% Ar + 3% (11/12 O_2 + 1/12 C_7H_{16}). Measurement of the time of existence of stationary conditions behind the wave, reflected from the end of the shock tube established that the experimental value of this time differs considerably from that obtained from the theory. In the investigation of an exothermic reaction after reflection from the end and incidence on the end of the shock waves, it was estab-

Card 1/3

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On applying shock tubes...

lished that even with a strong dilution of the reagents by an inert gas the reaction has an explosive character with the formation of intensive compression waves behind the reflected wave. In these conditions an empirical formula is obtained for the time of ignition delay τ (in sec) $\tau = 10^{-7} p^{-1.8} \exp(C/RT)$, where p is the initial pressure for the reaction (3 ÷ 20 atm), T is the temperature (2400 ÷ 1500°K), C = 30,000 cal/mole, R is the gas constant. The authors conclude that the investigation of exothermic reactions behind the reflected wave in shock tubes, by the registration of the velocity of the reflected shock wave, is complicated by interaction with the flow behind the incident wave and the breakdown of uniformity of pressure behind the reflected wave. In this connection, the region of applicability of the method of reflected shock waves as a means of measuring the ignition delay is limited to mixtures strongly diluted by inert gases and at not too great Mach numbers of the incident waves. It is shown that in investigating exothermic reactions behind the incident waves, the consideration arises of the absence of an ideal homogeneous picture with a plane

Card 2/3

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On applying shock tubes...

front of the shock wave and homogeneous combustion. [Abstracter's note: Complete translation]

Card 3/3

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KOGARKO, S.M. (Moskva); NOVIKOV, A.S. (Moskva)

Compression waves arising during combustion in tubes.
PMTF no.4:36-42 N-D '60. (MIRA 14:7)

1. Institut khimicheskoy fiziki AN SSSR.
(Combustion)

82690
S/062/60/000/008/003/012
B004/B054

11.1000

AUTHORS: Kogarko, S. M. and Borisov, A. A.

TITLE: Measurement of Retardations of Inflammation at High Temperatures

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, No. 8, pp. 1348-1353

TEXT: The authors wanted to measure and compare the retardation τ of the inflammation of various hydrocarbon - air mixtures. They describe their method of measuring the temperature dependence of τ, and indicate some preliminary test results. The gas mixture was ignited by a reflected shock wave. Fig. 1 shows a diagram of the experimental apparatus. It consists of a tube 6 m long and 50 mm in diameter, in which sections 1 and 2 are separated by a membrane, sections 2 and 3 by a cock the opening of which is equal to the tube diameter. Section 1 contains a detonating gas mixture (e.g. $CH_4 + 2O_2$) at an initial pressure of 1 - 4 atm. Section 2 is filled with an inert gas mixture having the same acoustic impedance as the gas

Card 1/3

S/062/60/000/008/003/012
B004/B054

Measurement of Retardations of Inflammation at High Temperatures

mixture exploding in section 3 (measuring chamber). The gas mixtures were prepared by dosing with a gas counter of the type ГСБ-400 (GSB-400) in rubber bags and by manual mixing, or by dosing under pressure in metal balloons and mixing by means of diffusion during 2 days. The measuring chamber contained 2 windows of organic glass. On one side, there was a discharging tube of the type ИФП-200 (IFP-200), on the opposite side there was a photorecorder. The window in front of the photorecorder was covered with a gelatin solution. The measuring chamber was connected with a piezo-quartz pickup which ignited the discharge tube on the passage of a shock wave, and an ionization pickup with an oscilloscope of the type OK-17M (OK-17M). The mixture in section 1 was ignited, the detonation wave ruptured the membrane, propagated as a shock wave in section 2, entered the measuring chamber 3, was reflected on the terminal flange of the chamber, and ignited the gas mixture. The intensity of the incident shock wave could be regulated by the initial pressure in section 1 (Fig. 2) The gelatin layer on the glass window became dull under the influence of the shock wave. Both this dulling and the flame were photorecorded (Fig. 3). Other substances, e.g. carbon black, were also used instead of gelatin. The authors calculate the gas temperature in the reflected shock wave. Fig. 4 shows the photograph of the ignition process in 2% C_7H_{16} + 98% air. A temperature increase

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Measurement of Retardations of Inflammation at High Temperatures

S/062/60/000/008/003/012
B004/B054

of 10^9 °K/sec was calculated. Figs. 5, 6 show log τ as a function of 1/T for different mixtures. Taking account of the fact that at an initial pressure of 1 atm the pressure in the shock wave rose to 50 atm at 1100°K, and to 90 atm at 1500°K, the following equation was written down for τ: $\tau = 10^{-9} \exp(13900/T)$. For stoichiometric mixtures of the paraffin hydrocarbons CH_4 to C_7H_{16} with air, $\tau \leq 10^{-5}$ sec at $T \geq 1500$°K. At $T \geq 1200$°K, τ for propane, butane, and heptane is greater than for benzene. The ionization degree of the gas can be calculated by the Sach equation. There are 6 figures and 4 references: 3 Soviet and 1 US.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences, USSR)

SUBMITTED: February 18, 1959

Card 3/3